

CHAPTER 2. TRAINING PROGRAMS AND AIRMAN QUALIFICATIONS

SECTION 6. FLIGHT TRAINING CURRICULUM SEGMENTS

461. GENERAL. This section specifies the objectives of flight training. Both the structure and content of flight training curriculum segments are discussed. Also clarified are the differences between training objectives and qualification objectives. Flight training consists of certain required maneuvers and procedures which are referred to as “training events”. The training events which must be included in flight training curriculum segments to satisfy the requirements of Federal Aviation Regulations (FAR) Parts 121 and 135, are specified in maneuvers and procedures tables (see tables 3.2.6.4. through 3.2.6.10.).

463. FLIGHT TRAINING OBJECTIVES. Flight training, as used in this section, means the conduct of training events in an aircraft, a flight simulator, or a flight training device in accordance with an approved training curriculum. Flight training (except for windshear training) may be conducted entirely in an aircraft. Flight training may also be conducted using a combination of an aircraft with either a flight simulator and/or a flight training device. In certain cases, flight training may be conducted entirely in an advanced flight simulator. In all cases, the primary objective of flight training is to provide an opportunity for flight crewmembers to acquire the skills and knowledge necessary to perform to a desired standard. This opportunity provides for demonstration, instruction, and practice of the maneuvers and procedures (training events) pertinent to a particular aircraft and crewmember duty position. Successful completion of flight training is validated by appropriate testing and checking.

465. QUALIFICATION OBJECTIVES. The objective of the qualification curriculum segment is to determine whether enough learning has occurred by comparing an individual's performance in practical situations, to established standards. A person meeting the qualification objectives satisfactorily completes the curriculum. A person failing to meet these objectives must be returned to training status. After additional training, that person must retake and satisfactorily complete at least the previously unsatisfactory portions of the qualification curriculum segment.

467. FLIGHT TRAINING MODULES OR EVENT OUTLINES.

A. A flight training curriculum segment may be outlined in a modular format or may be outlined as a series of events in which training must be accomplished. This curriculum segment must include as many training modules or events as necessary to provide appropriate training. Each training module or event outline should provide at least the following information:

- A descriptive title of the training module
- A list of the training events that must be accomplished during flight training
- Any specific conditions applicable to a particular training event such as the weather minimums to be used
- Provisions for briefing before and after each training period

B. The operator may submit an outline containing training modules representing blocks of training events, or the operator may submit an outline listing all the elements and events to be accomplished during the flight training. Other forms of presenting the flight training curriculum segment may be acceptable. Regardless of the format used, inspectors should evaluate a proposed flight training curriculum by comparing it with the maneuvers and procedures tables in this section. During actual training, the order and rate of training event presentation may vary. An instructor may vary the events in a published curriculum segment, during any particular period, when a student's progress indicates it is necessary. However, a required event must not be omitted from the curriculum segment. A principal operations inspector (POI) may need to review the operator's flight training courseware, such as lesson plans or instructor guides, to assure that a plan exists in which all events will be appropriately accomplished. To further support that a plan exists, a POI may need to review the forms that will be used to record flight training. It is unnecessary for the POI to approve courseware or training record forms.

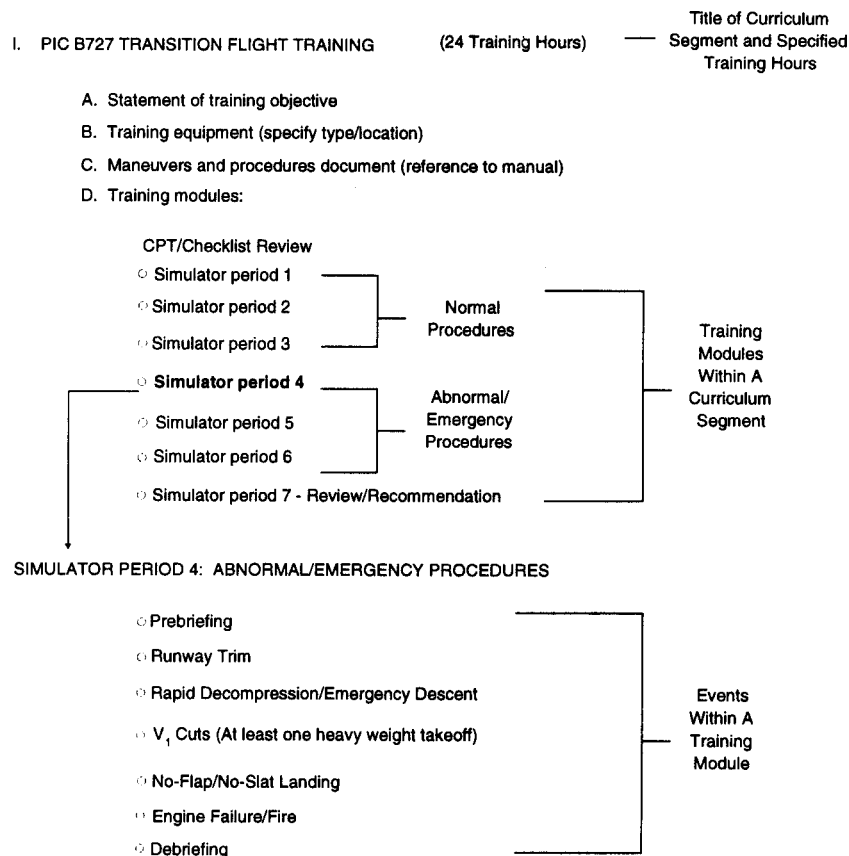
C. It is unnecessary to include detailed descriptions of how specific maneuvers or procedures will be accomplished in a flight training module outline or training event outline. However, detailed descriptions must be included in an Federal Aviation Administration (FAA)-approved aircraft flight manual (AFM), the operator's aircraft operating manual, or in a separate maneuvers and procedures document. Detailed descriptions or pictorial displays are required for certain normal, abnormal, and emergency maneuvers, procedures, and functions which are performed in flight training. POI's may require operators to provide extremely detailed training outlines in any of the following situations:

- When directed by AFS-200
- When a new technology or procedure is addressed in the training module (examples include fly-by-wire aircraft control, and helicopter IFR flight slower than V_{mini})
- When an operator has had approval of a curriculum segment withdrawn because of deficiencies, the POI may require any redeveloped flight curriculum segments to

include highly detailed training module or training event outlines (The level of detail should provide sufficient information for the POI to determine that previously identified deficiencies are corrected.)

D. To ensure regulatory compliance, the training module or training event outlines must contain at least the training events listed in the appropriate maneuvers and procedures tables in this section. The interrelationship of training modules and/or training events in a curriculum segment should provide for an orderly and practical progression of training. For example, taxiing may be listed as a training event in the first module of a flight training curriculum segment but does not have to be listed in subsequent training modules, even though training on the taxiing maneuver will occur throughout flight training. Training event modules should be developed so that training events are presented in a logical sequence. For example, missed approach training should be conducted in conjunction with approach training.

E. The following example illustrates the interrelationship of a curriculum segment and training modules when a modular format is used:



469. TRAINING HOURS. Flight training curriculum segments must specify a planned number of training hours. The operator's proposed number of training hours must realistically allow enough time for demonstration, instruction, and practice of the training events listed in the entire curriculum segment. A POI shall not approve a proposed flight training curriculum segment unless the specified training hours realistically allow enough time to accomplish the required training events.

A. FAR §§ 121.424 and 121.425 specify programmed hours of flight training for pilots and flight engineers enrolled in the initial new-hire and initial equipment categories of training. It is national direction and guidance that the training hours specified for any FAR Part 121 pilot-in-command (PIC), second-in-command (SIC), or flight engineer (FE) flight training curriculum segments shall not be less than the programmed hours specified by FAR §§ 121.424(c) and 121.425(b). Table 3.2.6.1. lists the FAR Part 121 programmed hours.

TABLE 3.2.6.1.
FAR PART 121 REGULATORY PROGRAMMED HOURS
FAR-Programmed Hours By Category of Training

		Initial New-Hire			Initial Equipment		
		PIC	SIC	FE	PIC	SIC	FE
FAR Part 121 Airplane Groups	Group I (Reciprocating)	10	6	6	10	6	6
	Group I (Turboprop)	15	7	7	15	7	7
	Group II (Turbojet)	20	10	10	20	10	10

B. FAR § 121.427(d)(1) and (2) stipulate that programmed hours are not specified for pilot or flight engineer recurrent flight training. However, if the flight training is conducted in an approved airplane flight simulator, FAR § 121.409(b)(1) requires at least 4 hours of training at the pilot controls for PIC and SIC training. Four hours of training are required regardless of whether the training is conducted on the events listed in FAR Part 121, Appendix F, or the training is conducted under an approved line-oriented flight training (LOFT) program.

C. FAR Part 121 does not specify programmed hours for the other categories of training. FAR Part 135 does not specify programmed hours for any of the categories of training. The number of training hours must be specified, however, on all flight training curriculum segment outlines. Because of the various situations that can be encountered, it is difficult to provide guidance on acceptable training hours for flight training curriculum segments. POI's must thoroughly study an operator's proposals. Based on experience with the operator, past experiences with other operators, as well as their own training experiences, POI's must use reasonable judgment when determining whether the training can be adequately accomplished within the training hours specified by the curriculum segment.

D. When flight training is conducted in a flight simulator or training device, it is acceptable and preferable for the flight training curriculum segment to be developed so that two pilots can be trained during a single flight training session. This includes the training of a PIC and SIC, two PIC's, or two SIC's at the same time. During this type of training, one pilot (pilot A) manipulates the controls of the aircraft while the other pilot (pilot B) performs the duties of the "pilot-not-flying" (PNF) the aircraft. During the same training session, the pilots reverse roles. Pilot B manipulates the controls, and pilot A performs the duties of the PNF. The duties of the PNF are typically included in the operator's aircraft operating manuals and/or in the maneuvers and procedures document. These duties include normal, abnormal, and emergency duties (that are performed by the PNF) and the crew participation activities (crew resource management (CRM) concepts) used by the operator. Both pilots are receiving essential "crew-concept" training throughout the training session. Therefore, the total training hours accomplished during the training session can be credited to each of the participating pilots. For example, if a PIC and an SIC participated in a 4-hour flight simulator session, both pilots would receive 4 hours of training credit. This method of crediting training hours is valid only when both student

pilots manipulate the controls for approximately equal amounts of time. This method of crediting training hours is not valid when the instructor is providing instruction and also is occupying one of the pilot seats of the flight simulator, flight training device, or aircraft.

E. Both recurrent and qualification LOFT training sessions should be based on at least 4 hours of total crewmember training activity. When the guidance in AC 120-35B, “Line Operational Simulations: Line-Oriented Flight Training, Special Purpose Operational Training, Line Operational Evaluation” (as revised) is followed, all crewmembers who participate in a LOFT training session are credited with 4 hours of training time, as follows:

(1) *Two Trainees.* Appropriate crew composition is central to the LOFT training concept. Acceptable scheduling practices and crew substitution allowances differ in recurrent LOFT and qualification LOFT. Refer to AC 120-35B for specific differences. When the crew consists of two PIC trainees or two SIC trainees, both pilots should receive full credit (4 hours), provided the following conditions are met:

- The LOFT session conforms to the minimum 4-hour format described in Advisory Circular (AC) 120-35B
- At least 2 1/2 hours are spent in the LOFT scenario
- The pilots swap seats at approximately the midpoint in the LOFT flight segment

(2) *One Trainee.* When only one trainee participates in qualification LOFT, that trainee should receive full credit (4 hours), provided the following conditions are met:

- The LOFT session conforms to the minimum 4-hour format described in AC 120-35
- At least 2 1/2 hours are spent in the LOFT scenario (including spot)

NOTE: A 2-hour qualification LOFT session for one pilot does not meet the training requirements of FAR Part 121, Appendix H. A qualification LOFT program consists of at least a 4-hour course of training for each flightcrew.

F. Tables 3.2.6.2. and 3.2.6.3. specify established national norms for flight training curriculum segments. These norms are based on the assumption that there is reasonable training support, such as proficient instructors and well-organized flight instructor guides. The national norms in table 3.2.6.2. are for flight train-

ing when most or all of it is being conducted in a flight training device or flight simulator, and when two pilots are being trained at the pilot controls during the same training session (see subparagraph D). The national norms in table 3.2.6.3. are for flight training when only one pilot is being trained in a flight training device or flight simulator, or when flight training is conducted entirely in an aircraft.

G. When determining the adequacy of flight training hours, a POI should use these national norms as a point from which other factors shall be weighed. There may be many reasons why the training hours need to be greater than the national norm. The operator may need to specify more hours because of the complexity of the aircraft or types of operation. The POI may need to require more hours because of inadequate training support. Conversely, training hours fewer than the national norm may be fully acceptable due to the use of highly sophisticated, modern training methods, effective systems integration in aircraft ground training, less complex aircraft, or the conduct of a less complex type of operation. Some factors that would indicate a need for more training hours may be counterbalanced by other factors indicating that fewer training hours are necessary. The following diagram illustrates some of the factors that should be considered when determining the adequacy of flight training hours:

Special Operations	No Special Operations	
New Entrant Operator	Basic Servo/Mechanical Instruments	
Complex Pilot Operation of Aircraft Systems, Engines, Propellers	Pilot Experience with Similar Aircraft	
Critical Aircraft Performance	Modern Simulators and Training Devices	
EFIS, FMS, Autoflight	Well Organized Flight Instructor Guides	
Dissimilar Flightcrew Experience Levels	Basic Navigation System	
Low Visibility Capabilities	Simple Flight Handling Characteristics	
Complex Navigation Systems	Effective System Integration Training	
More than National Norm	National Norm	Less than National Norm

TABLE 3.2.6.2.
FLIGHT TRAINING HOURS
(NATIONAL NORMS)
TWO PILOTS: FLIGHT TRAINING DEVICE AND/OR FLIGHT SIMULATOR

		CATEGORY OF TRAINING				
T R A N S P O R T & C O M M U T E R C A T	Family of Aircraft	Initial New-Hire	Initial Equipment	Transition	Upgrade	Recurrent
	Part 121 Group I (Reciprocating)	PIC - 24 SIC - 24 FE - 20	PIC - 20 SIC - 20 FE - 20	PIC - 20 SIC - 20 FE - 20	SIC TO PIC 8 FE TO SIC 20	PIC - 4 SIC - 4 FE - 4
	Part 121 Group I (Turboprop)	PIC - 24 SIC - 24 FE - 20	PIC - 20 SIC - 20 FE - 20	PIC - 20 SIC - 20 FE - 20	SIC TO PIC 8 FE TO SIC 20	PIC - 4 SIC - 4 FE - 4
	Part 121 Group II (Turbojet)	PIC - 28 SIC - 28 FE - 20	PIC - 24 SIC - 24 FE - 20	PIC - 24 SIC - 24 FE - 20	SIC TO PIC 8 FE TO SIC 28	PIC - 4 SIC - 4 FE - 4
	Part 135 Transport and Commuter Category	PIC - 24 SIC - 24	PIC - 20 SIC - 20	PIC - 20 SIC - 20	SIC TO PIC 8	PIC - 4 SIC - 4
M E U N L G T I N E	Part 135 IFR/VFR	PIC - 16 SIC - 16	PIC - 12 SIC - 12	PIC - 8 SIC - 8	SIC TO PIC 4	PIC - 2 SIC - 2
	Part 135 VFR Only	PIC - 4 SIC - 4	PIC - 4 SIC - 4	PIC - 4 SIC - 4	SIC TO PIC 4	PIC - 1 SIC - 1
S E I N G I L N E E	Part 135 IFR/VFR	PIC - 8 SIC - 8	PIC - 4 SIC - 4	PIC - 4 SIC - 4	SIC TO PIC 2	PIC - 2 SIC - 2
	Part 135 VFR Only	PIC - 4 SIC - 4	PIC - 4 SIC - 4	PIC - 2 SIC - 4	SIC TO PIC 2	PIC - 1 SIC - 1
C H O P L T I E R	IFR/VFR	PIC - 16 SIC - 16	PIC - 12 SIC - 12	PIC - 8 SIC - 8	SIC TO PIC 4	PIC - 2 SIC - 2
	VFR Only	PIC - 4 SIC - 4	PIC - 4 SIC - 4	PIC - 4 SIC - 4	SIC TO PIC 4	PIC - 1 SIC - 1

TABLE 3.2.6.3.
FLIGHT TRAINING HOURS
(NATIONAL NORMS)
ONE PILOT: FLIGHT TRAINING DEVICE AND/OR FLIGHT SIMULATOR OR WHEN ALL
TRAINING IS CONDUCTED IN AN AIRCRAFT

		CATEGORY OF TRAINING				
T R A N S P O R T & C O M M U T E R C A T	Family of Aircraft	Initial New-Hire	Initial Equipment	Transition	Upgrade	Recurrent
	Part 121 Group I (Reciprocating)	PIC - 14 SIC - 14 FE - 12	PIC - 14 SIC - 14 FE - 12	PIC - 12 SIC - 12 FE - 12	SIC TO PIC 6 FE TO SIC 14	PIC - 4 SIC - 4 FE - 4
	Part 121 Group I (Turboprop)	PIC - 15 SIC - 15 FE - 12	PIC - 15 SIC - 15 FE - 12	PIC - 12 SIC - 12 FE - 12	SIC TO PIC 6 FE TO SIC 15	PIC - 4 SIC - 4 FE - 4
	Part 121 Group II (Turbojet)	PIC - 20 SIC - 16 FE - 12	PIC - 20 SIC - 16 FE - 12	PIC - 12 SIC - 12 FE - 12	SIC TO PIC 6 FE TO SIC 16	PIC - 4 SIC - 4 FE - 4
	Part 135 Transport and Commuter Category	PIC - 12 SIC - 12	PIC - 10 SIC - 10	PIC - 8 SIC - 8	SIC TO PIC 6	PIC - 4 SIC - 4
M E U N L G T I N E	Part 135 IFR/VFR	PIC - 8 SIC - 8	PIC - 6 SIC - 6	PIC - 6 SIC - 6	SIC TO PIC 4	PIC - 3 SIC - 3
	Part 135 VFR Only	PIC - 4 SIC - 4	PIC - 3 SIC - 3	PIC - 3 SIC - 3	SIC TO PIC 2	PIC - 2 SIC - 2
S E I N G I L N E E	Part 135 IFR/VFR	PIC - 6 SIC - 6	PIC - 4 SIC - 4	PIC - 4 SIC - 4	SIC TO PIC 4	PIC - 3 SIC - 3
	Part 135 VFR Only	PIC - 3 SIC - 2	PIC - 2 SIC - 1	PIC - 2 SIC - 1	SIC TO PIC 1	PIC - 1 SIC - 1
C H O P E L T I E R	IFR/VFR	PIC - 10 SIC - 10	PIC - 8 SIC - 8	PIC - 6 SIC - 6	SIC TO PIC 4	PIC - 4 SIC - 4
	VFR Only	PIC - 4 SIC - 4	PIC - 3 SIC - 3	PIC - 3 SIC - 3	SIC TO PIC 2	PIC - 2 SIC - 2

471. COURSE COMPLETION REQUIREMENTS.

A. Ordinarily, a flight crewmember completes a flight training curriculum segment by successfully accomplishing each training event and the specified number of training hours. Flight crewmembers are then required to successfully meet the requirements specified in the qualification curriculum segment (see section 9 for the qualification curriculum segment requirements). If a person fails to meet any of the qualification requirements because of a lack in flight proficiency, that person must be returned to training status. After retraining, an instructor recommendation is required for reaccomplishing the unsatisfactory qualification requirement.

B. A flight crewmember may successfully complete a flight training curriculum segment without completing the specified number of training hours, provided all of the following conditions are met:

- (1) The crewmember successfully completes all of the training events required by the curriculum segment.
- (2) An instructor recommends the flight test be conducted before completion of the specified number of training hours. The recommendation must be suitably documented.
- (3) The flight crewmember satisfactorily completes the qualification curriculum segment requirements. If a flight crewmember fails to meet the qualification curriculum segment requirements because of a lack in flight proficiency, he must be required to complete all the training hours specified in the flight training curriculum segment. The crewmember must then be recommended by an instructor before reaccomplishing the failed qualification requirements.

473. EVALUATION OF FLIGHT TRAINING CURRICULUM SEGMENT OUTLINES FOR INITIAL APPROVAL. When evaluating a flight training proposal for initial approval, an inspector must determine that the proposed curriculum segment meets the following requirements:

A. The training events must be consistent with the maneuvers and procedures tables applicable to the specific category of training. An inspector must select the appropriate maneuvers and procedures table and make a side-by-side comparison of the table and the proposed flight training curriculum segment. The required training events and the appropriate level flight training device, flight simulator, or aircraft to be used must be in the proposal. Omission of any required training event or inappropriate use of a flight

training device or flight simulator is sufficient reason to deny initial approval.

B. The specified training hours are realistic, as discussed in paragraph 469.

C. The training emphasizes specific areas applicable to the category of training. Since flight training curriculum outlines are not usually constructed in a manner that allows for a determination that appropriate areas are emphasized, an inspector must examine courseware (such as flight instructor guides and LOFT scenarios) to determine if appropriate areas will be emphasized and if the operator is capable of developing acceptable courseware. In the paragraphs preceding the applicable maneuvers and procedures tables in this section, training emphasis considerations for each category of flight training are discussed.

475. EVALUATING THE OPERATOR'S MANEUVERS AND PROCEDURES DOCUMENT.

The operator must provide a maneuvers and procedures document for approval by the FAA. An inspector must determine that this document provides detailed descriptions or pictorial displays for the normal, abnormal, and emergency maneuvers, including the procedures and functions that will be performed in flight training. Instructor guides or lesson plans which support the maneuvers and procedures document should specify the conditions (such as weather, aircraft weight, and other parameters) to be applied during training on a maneuver or procedure. The conditions specified in these guides or lesson plans should be equivalent to the types of operations authorized by the operations specifications, such as low visibility takeoffs or the use of Category I (CAT I) or Category II (CAT II) minimums. FAA policy requires detailed descriptions (or pictorial displays) of at least those training events identified with the symbol **M** in the appropriate maneuvers and procedures tables. Maneuvers and procedures documents must be evaluated in sufficient detail to ensure the following requirements are met:

- The descriptions of applicable maneuvers or procedures must conform to recommendations made in the Flight Standardization Board report when appropriate.
- The description of each maneuver or procedure must conform to the operating limitations and procedures in the FAA-approved airplane/rotorcraft flight manual or the operator's aircraft operating manual.
- The description of each maneuver or procedure must conform to the certificate holder's procedural instructions for cockpit checks,

altitude awareness, required callouts, crew coordination, and cockpit resource management.

- The description of each maneuver or procedure must specify the operator's procedures, such as altitudes, configuration airspeeds, and other parameters.

477. AIRCRAFT FAMILIES. The four families of aircraft used in Part 121 and Part 135 operations are described in paragraph 285 of section 1. The flight training requirements for flight crewmembers differ significantly between each family. Within each family, the flight training requirements are similar, even though individual aircraft may differ significantly in construction and appearance. The maneuvers and procedures tables have been tailored to account for similar flight crewmember knowledge, skill, and ability requirements common to aircraft of a particular family and specific to different kinds of operations within a family.

A. Transport and Commuter Category Airplane Family. Airplanes in this family are similar in operational characteristics. Crewmembers of airplanes in this family are required to have similar knowledge, skills, and abilities regardless of the applicable operating regulation (FAR Part 121 or FAR Part 135). The maneuvers and procedures tables containing required training events for flight crewmembers operating airplanes in this family are in paragraphs 499 through 505 (see tables 3.2.6.4 through 3.2.6.7).

B. Multiengine General Purpose Airplane Family. Crewmembers of airplanes in this family are required to have similar knowledge, skills, and abilities when operating under FAR Part 135. The flight training events required for flight crewmembers operating airplanes in this family are identified in the maneuvers and procedures table in paragraph 507 (see table 3.2.6.8.).

C. Single-Engine Airplane Family. Crewmembers of airplanes in this family are required to have similar knowledge, skills, and abilities to be operated under Part 135. The flight training events required for the operation of single-engine airplanes are identified in the maneuvers and procedures table in paragraph 509 (see table 3.2.6.9).

D. Helicopter Family. Crewmembers operating helicopters under FAR Part 135 are required to have similar knowledge, skills, and abilities. The flight training events required for flight crewmembers operating helicopters are identified in the maneuvers and procedures table in paragraph 511 (see table 3.2.6.10.).

479. FLIGHT TRAINING DEVICES AND FLIGHT SIMULATORS. Flight training equipment consists of seven levels of flight training devices, four levels of flight simulators, and the aircraft. The approved use of each item of flight training equipment is listed in the maneuvers and procedures tables. These devices and simulators are the only types of flight training equipment (other than aircraft) which may be approved for use in an FAA-approved flight training program. Before any level 1 through level 5 flight training device can be used, it must be evaluated by the POI to determine that it meets the prescribed requirements for the appropriate level of flight training device. Before a specific level 6 and 7 training device or any level flight simulator can be used, it must be evaluated and qualified by the National Simulator Program Manager (NSPM) and approved by the operator's POI. The following paragraphs describe the flight training devices and flight simulators applicable to FAR Parts 121 and 135 flight training. Advisory circulars 120-40 and 120-45 (as amended) provide the qualification policy, and criteria, as well as more detailed technical descriptions of flight simulators and flight training devices. The functional descriptions in the following paragraphs provide only a brief overview. Therefore, the appropriate advisory circulars are the only authorized source documents and must be used for evaluation and approval of flight training devices and flight simulators.

NOTE: The functional and technical descriptions for the first three levels of flight training devices are presently under development and are not applicable to FAR Part 121 or FAR Part 135 flight training.

481. LEVEL 4 - FLIGHT TRAINING DEVICE.

A. Purpose: To permit learning, development, and the practice of skills and cockpit procedures necessary for understanding and operating the integrated systems of a specific aircraft.

B. Functional Description: A level 4 training device has the following characteristics and components:

- A replica of the flight deck panels, switches, controls, and instruments, in proper relationship, to represent the aircraft for which training is to be accomplished
- Systems indications which respond appropriately to switches and controls which are required to be installed for the training or checking to be accomplished
- Air/ground logic (however, simulated aerodynamic capabilities are not required)

483. LEVEL 5 - FLIGHT TRAINING DEVICE.

A. *Purpose:* To permit learning, development, and the practice of skills, cockpit procedures, and instrument flight procedures necessary for understanding and operating the integrated systems of a specific aircraft in typical flight operations in real time.

B. *Functional Description:* A level 5 training device has the following characteristics and components:

- A replica of the flight deck panels, switches, controls, and instruments, in proper relationship, to represent the aircraft for which training is to be accomplished
- Systems indications which respond appropriately to switches and controls which are required to be installed for the training or checking to be accomplished
- Simulated aerodynamic capabilities representative of the aircraft group or class
- Functional flight and navigational controls, displays, and instrumentation
- Control forces and control travel of sufficient precision for manually flying an instrument approach.

485. LEVEL 6 - FLIGHT TRAINING DEVICE.

A. *Purpose:*

(1) To permit learning, development, and the practice of skills in cockpit procedures, instrument flight procedures, certain symmetrical maneuvers and flight characteristics necessary for operating the integrated systems of a specific aircraft in typical flight operations.

(2) To permit the use of previously approved non-visual simulators and the continued use of Level 6 and 7 flight training devices (formerly known as advanced training devices (ATD)) for those FAR Part 135 operators approved to use them.

NOTE: Nonvisual simulators are categorized with level 6 training devices and may continue to be used as previously approved, or as prescribed in FAR Part 61, Appendix A and FAR Part 121, Appendices E and F.

B. *Functional Description:* A level 6 training device has the following characteristics and components:

- Systems indications which respond appropriately to switches and controls which are required to be installed

- A replica of the cockpit of the aircraft for which training is to be accomplished
- Simulated aerodynamic capabilities which closely represent the specific aircraft in ground and flight operations
- Functional flight and navigational controls, displays, and instrumentation
- Control forces and control travel which correspond to the aircraft
- Instructor controls

487. LEVEL 7 - FLIGHT TRAINING DEVICE.

A. *Purpose:* To permit learning, development, and the practice of skills in cockpit procedures, instrument flight procedures and maneuvers, and flight characteristics necessary for operating the integrated systems of a specific aircraft in typical flight operations.

B. *Functional Description:* A level 7 training device has the following characteristics and components:

- Systems representations, switches, and controls which are required by the type design of the aircraft and by the approved training program
- Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated
- Full-scale replica of the cockpit of the aircraft being simulated
- Correct simulation of the aerodynamic and ground dynamic characteristics of the aircraft being simulated
- Correct simulation of the effects of selected environmental conditions which the simulated aircraft might encounter
- Control forces, dynamics, and travel which correspond to the aircraft
- Instructor controls and seat

489. LEVEL A FLIGHT SIMULATOR.

A. *Purpose:* To permit development and practice of the necessary skills for accomplishing flight operational tasks, to a prescribed standard of airman competency, in a specific aircraft and duty position. Level A flight simulators may be used for specified pilot recency of experience requirements and specified flight operational task training requirements in transition, upgrade, recurrent, and requalification training under Parts 121 and 135. It may also be used

for initial new-hire and initial equipment training on specified events.

NOTE: Level A flight simulators comply with the technical standards specified for basic (visual) simulators in AC 120-40, as amended.

B. *Functional Description:* Level A flight simulators have the following characteristics and components:

- Systems representations, switches, and controls which are required by the type design of the aircraft and by the user's approved training program
- Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated
- Full-scale replica of the cockpit of the aircraft being simulated
- Correct simulation of the aerodynamic characteristics of the aircraft being simulated
- Correct simulation of the effects of selected environmental conditions which the simulated aircraft might encounter
- Control forces and travel which correspond to the aircraft
- Instructor controls and seat
- At least a night visual system with the minimum of a 45° horizontal by 30° vertical field of view for each pilot station
- A motion system with at least 3 degrees of freedom

491. LEVEL B FLIGHT SIMULATOR.

A. *Purpose:* To permit development and practice of the necessary skills for accomplishing flight operational tasks, to a prescribed standard of airman competency, in a specific aircraft and duty position. Level B flight simulators may be used for pilot recency of experience requirements and for specified flight operational task training requirements in transition, upgrade, recurrent, and requalification training under FAR Parts 121 and 135. It may also be used for initial new-hire and initial equipment training on specified events. Level B simulators may also be used to accomplish night takeoffs and landings and for landings in a proficiency check.

NOTE: Level B flight simulators comply with the technical standards specified for Phase I simulators in Part 121, Appendix H and AC 120-40, as amended.

B. *Functional Description:* Level B flight simulators have the following characteristics and components:

- Systems representations, switches, and controls which are required by the type design of the aircraft and by the user's approved training program
- Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated
- Full-scale replica of the cockpit of the aircraft being simulated
- Correct simulation of the aerodynamic (including ground effect) and ground dynamic characteristics of the aircraft being simulated
- Correct simulation of the effects of selected environmental conditions which the simulated aircraft might encounter
- Control forces and travel which correspond to the aircraft
- Instructor controls and seat
- At least a night visual system with a minimum of a 45° horizontal by 30° vertical field of view for each pilot station
- A motion system with at least 3 degrees of freedom

493. LEVEL C FLIGHT SIMULATOR.

A. *Purpose:* To permit development and practice of the necessary skills for accomplishing flight operational tasks, to a prescribed standard of airman competency, in a specific aircraft and duty position. Level C flight simulators may be used for pilot recency of experience requirements and for specified flight operational task training in transition, upgrade, recurrent, and requalification training under FAR Parts 121 and 135. It may also be used for initial new-hire and initial equipment training on certain specified events. All training events may be conducted in a Level C flight simulator for persons who have previously qualified as PIC or SIC with that operator.

NOTE: Level C flight simulators comply with the technical standards specified for "Phase II simulators" in FAR Part 121, Appendix H and AC 120-40 (as amended).

B. *Functional Description:* Level C flight simulators have at least the following characteristics and components:

- Systems representations, switches, and controls which are required by the type design of the aircraft and by the user's approved training program
- Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated
- Full-scale replica of the cockpit of the aircraft being simulated
- Correct simulation of the aerodynamic including ground effect, and ground dynamic characteristics of the aircraft being simulated
- Correct simulation of the effects of selected environmental conditions which the simulated aircraft might encounter
- Control forces, dynamics, and travel which correspond to the aircraft
- Instructor controls and seat
- At least a night and dusk visual system with a minimum of a 75° horizontal by 30° vertical field of view for each pilot station
- A motion system with at least 6 degrees of freedom

495. LEVEL D FLIGHT SIMULATOR.

A. *Purpose:* To permit development and practice of the necessary skills for accomplishing flight operational tasks, to a prescribed standard of airman competency, in a specific aircraft and duty position. Level D flight simulators may be used for FAR Parts 121 and 135 pilot currency and for all flight operational task training except for static aircraft training.

NOTE: Level D flight simulators comply with the technical standards specified for "Phase III simulators" in FAR Part 121, Appendix H and AC 120-40 (as amended).

B. *Functional Description:* Level D flight simulators have the following characteristics and components:

- Systems representations, switches, and controls which are required by the type design of the aircraft and by the user's approved training program
- Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated
- Full-scale replica of the cockpit of the aircraft being simulated

- Correct simulation of the aerodynamic (including ground effect) and ground dynamic characteristics of the aircraft being simulated
- Correct simulation of selected environmentally-affected aerodynamic and ground dynamic characteristics of the aircraft being simulated considering the full range of its flight envelope in all approved configurations
- Correct and realistic simulation of the effects of environmental conditions which the aircraft might encounter
- Control forces, dynamics, and travel which correspond to the aircraft
- Instructor controls and seat
- A daylight, dusk, and night visual system with the minimum of a 75° horizontal by 30° vertical field of view for each pilot station
- A motion system with at least 6 degrees of freedom

497. MANEUVERS AND PROCEDURES TABLES.

A. The events which must be accomplished during flight training are listed in the maneuvers and procedures tables in this section. The requirements of FAR Parts 121 and 135 are included in these tables. These tables can be used as a single source document in the development and evaluation of flight training curriculum segment proposals. Compliance with the provisions of these tables automatically ensures that all requirements of both FAR Parts 121 and 135 are met. These tables also contain the acceptable flight training equipment (training devices, simulators, or aircraft) which may be used for any training event. An "X" indicates that the specified flight training device or flight simulator has been qualified for that event without further consideration or approval. An "A" indicates that a lower level device or simulator may be used for procedural training if that device has the necessary systems representations and functions for training on the event. These systems representations and functions exceed the basic requirements for that level device or simulator, therefore, an "A" indicates, that the device or simulator must be evaluated and approved for each particular event. Any maneuver or procedure permitted in a specific level of flight training device or flight simulator, may also be conducted in a higher level of flight training device, flight simulator, or the aircraft itself (providing the event can safely be accomplished in the aircraft). Cer-

tain training events within the tables are preceded with a box ([]). If the operator is authorized (or required) to conduct these maneuvers by operations specifications (for example, a circling approach), a POI should check the appropriate box to indicate these events must be included in the training curriculum. Certain optional training events indicated by a pound sign (#) in the maneuvers and procedures tables are not specifically required by the regulations or operations specifications. Many of these optional training events, however, are often included in an operator's flight training curriculums and should be conducted in a properly qualified device or simulator.

B. Windshear training is a training event in each table. The tables indicate that windshear training may only be performed in a level 7 flight training device or any level of flight simulator. Operators who do not use a level 7 flight training device or flight simulator may perform their wind-shear/microburst training in accordance with the guidelines in the FAA document entitled, "Windshear Training Aid."

C. Preceding each maneuver and procedure table is a paragraph which states the required maneuvers and procedures for each crewmember and provides guidance on specific areas of emphasis which should be included in the training.

499. PIC/SIC INITIAL NEW-HIRE AND INITIAL EQUIPMENT FLIGHT TRAINING: TRANSPORT AND COMMUTER CATEGORY AIRPLANES.

A. *Required Maneuvers and Procedures.* Training in the maneuvers and procedures in table 3.2.6.4. must be conducted for satisfactory completion of initial new-hire and initial equipment flight training.

(1) PIC's must complete training in each training event in this table.

(2) SIC's must complete training in each training event in this table. SIC training in the following events does not require manipulation of the primary aircraft controls but should emphasize duties of the pilot-not-flying:

- Steep turns
- Approach and landing with pitch mistrim
- Approach and landing with 50% loss of power
- Approach and landing with flap/slat malfunction

B. *Training Emphasis Considerations.* A POI should ensure that the operator's flight training emphasizes appropriate areas for these categories of training:

(1) *For Initial New-Hire Training,* emphasis should be on specific company procedures and procedures for the particular aircraft.

(2) *For Initial Equipment Training,* emphasis should be on company procedures specific to the aircraft.

TABLE 3.2.6.4. FLIGHT TRAINING
PIC/SIC INITIAL NEW-HIRE AND INITIAL EQUIPMENT FLIGHT TRAINING:
TRANSPORT AND COMMUTER CATEGORY AIRPLANES
(FRONT)

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
						VIS	PH I	PH II	PH III	
PREPARATION	Visual Inspection (For aircraft with F/E, use of pictorial display authorized)									X
	Prestart Procedures	A	A	X	X	X	X	X	X	X
	Performance Limitations	X	X	X	X	X	X	X	X	X
SURFACE OPERATION	Pushback			X	X	X	X	X	X	X
	[] Powerback Taxi							X	X	X
	Starting	A	A	X	X	X	X	X	X	X
	Taxi							X	X	X
	Pretakeoff Checks	A	A	X	X	X	X	X	X	X
TAKEOFF	Normal M								X	X
	Crosswind								X	X
	Rejected M			X	X	X	X	X	X	X
	Power Failure V_1 M					X	X	X	X	X
	Powerplant Failure During Second Segment #					X	X	X	X	X
	[] Lower than Standard Minimum					X	X	X	X	X
CLIMB	Normal			X	X	X	X	X	X	X
	One-engine Inoperative During Climb to En Route Altitude #					X	X	X	X	X
EN ROUTE	Steep Turns PIC			X	X	X	X	X	X	X
	Approaches to Stalls: M (Takeoff Config.) (En Route Config.) (Landing Config.) X* Only if stall warning/stall avoidance provides first first stall indication			X*	X*	X	X	X	X	X
	Inflight Powerplant Shutdown	A	A	X	X	X	X	X	X	X
	Inflight Powerplant Restart		A	X	X	X	X	X	X	X
	High Speed Handling Characteristics					X	X	X	X	X
DESCENT	Normal			X	X	X	X	X	X	X
	Maximum Rate					X	X	X	X	X
APPROACHES	VFR Procedures M Visual Approach								X	X
	With 50% Loss of Power on One-side PIC M (2 engines inoperative on 3-engine airplanes) A* (May be accomplished in levels A, B, or C provided one engine inoperative training is conducted in level D or the aircraft)					A*	A*	A*	X	X
	With Slat/Flap Malfunction PIC M					X	X	X	X	X
	IFR Precision Approaches M ILS/Normal								X	X
	ILS/One-Engine Inoperative								X	X
	[] MLS/Normal								X	X
	[] MLS/One-Engine Inoperative								X	X
	[] PAR/Normal					X	X	X	X	X
	[] PAR/One-Engine Inoperative #					X	X	X	X	X
	IFR Nonprecision Approaches M NDB/Normal			A*	A*	X	X	X	X	X
	VOR/Normal A* At least one nonprecision approach must be accomplished in a level A or higher simulator or the aircraft			A*	A*	X	X	X	X	X
	Nonprecision Approach One Engine Inoperative #					X	X	X	X	X
	[] LOC Backcourse Procedures		A	X	X	X	X	X	X	X
	[] SDF/LDA Procedures		A	X	X	X	X	X	X	X
	[] ASR Procedures		A	X	X	X	X	X	X	X
	[] RNAV Procedures		A	X	X	X	X	X	X	X
	[] LORAN C Procedures		A	X	X	X	X	X	X	X

**TABLE 3.2.6.4.—Continued
FLIGHT TRAINING
PIC/SIC INITIAL NEW-HIRE AND INITIAL EQUIPMENT FLIGHT TRAINING:
TRANSPORT AND COMMUTER CATEGORY AIRPLANES
(BACK)**

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
						VIS	PH I	PH II	PH III	
APPROACHES (Cont'd)	I Circling Approach M (Simulator must be qualified for training/checking on the circling maneuver)								X	X
	Missing Approaches M From Precision Approach					X	X	X	X	X
	From Nonprecision Approach					X	X	X	X	X
	With Powerplant Failure					X	X	X	X	X
	NOTE: At least one MAP must be a complete approved procedure. At least one MAP must be with a powerplant failure									
LANDINGS	Normal								X	X
	With Pitch Mistrim PIC								X	X
	From Precision Instrument Approach								X	X
	From Precision Instrument Approach With Most Critical Engine Inoperative								X	X
	With 50% Loss of Power on One Side PIC (2 engines inoperative on 3-engine airplanes) A*(May be accomplished in Levels A, B, or C provided one engine inoperative training is conducted in level D or the aircraft.)					A*	A*	A*	X	X
	With Flap/Slat Malfunction					X	X	X	X	X
	Crosswind								X	X
	With Manual Reversion/Degraded Control Augmentation					X	X	X	X	X
AFTER LANDING	Parking #							X	X	X
	Emergency Evacuation #			X	X	X	X	X	X	X
OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Holding			X	X	X	X	X	X	X
	Ice Accumulation on Airframe #				X	X	X	X	X	X
	Air Hazard Avoidance #					A	A	X	X	X
	Windshear/Microburst #					X	X	X	X	X
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE	Pneumatic/Pressurization	A	A	X	X	X	X	X	X	X
	Air Conditioning	A	A	X	X	X	X	X	X	X
	Fuel and Oil	A	A	X	X	X	X	X	X	X
	Electrical	A	A	X	X	X	X	X	X	X
	Hydraulic	A	A	X	X	X	X	X	X	X
	Flight Controls	A	A	X	X	X	X	X	X	X
	Anti-icing and Deicing Systems			X	X	X	X	X	X	X
	Autopilot		A	X	X	X	X	X	X	X
	Flight Management Guidance Systems and/or Automatic or Other Approach & Landing Aids		A	X	X	X	X	X	X	X
-Normal										
-Abnormal	Stall Warning Devices, Stall Avoidance Devices, and Stability Augmentation Systems			X	X	X	X	X	X	X
-Alternate	Airborne Weather Radar	A	A	X	X	X	X	X	X	X
	Flight Instrument System Malfunction		A	X	X	X	X	X	X	X
	Communications Equipment	A	A	X	X	X	X	X	X	X
	Navigation Systems	A	A	X	X	X	X	X	X	X
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE	Aircraft Fires	A	A	X	X	X	X	X	X	X
	Smoke Control	A	A	X	X	X	X	X	X	X
	Powerplant Malfunctions	A	A	X	X	X	X	X	X	X
	Fuel Jettison	A	A	X	X	X	X	X	X	X
	Electrical, Hydraulic, Pneumatic Systems	A	A	X	X	X	X	X	X	X
	Flight Control Systems Malfunction	A	A	X	X	X	X	X	X	X
-Emergency	Landing Gear and Flap Systems Malfunction	A	A	X	X	X	X	X	X	X

501. PIC/SIC TRANSITION AND UPGRADE FLIGHT TRAINING: TRANSPORT AND COMMUTER CATEGORY AIRPLANES.

A. *Required Maneuvers and Procedures.* Training in the maneuvers and procedures in table 3.2.6.5. must be conducted for satisfactory completion of transition or upgrade flight training.

(1) *For PIC Transition Training:* PIC's must complete training in each training event in this table.

(2) *For SIC Transition Training:* SIC's must complete training in each training event in this table. SIC training in the following events does not require manipulation of the primary flight controls but should emphasize the duties of the pilot-not-flying:

- Approach and landing with pitch mistrim
- Approach and landing with 50% loss of power
- Approach and landing with flap/slat malfunction
- Steep turns

(3) *For PIC Upgrade Training:* An SIC upgrading to PIC must complete training in each training event in this table (including those marked "**PIC**").

(4) *For Appendix H SIC-to-PIC Initial Equipment Training:* FAR Part 121, Appendix H "Phase II, Training and Checking Permitted" permits certain SIC's to be trained as PIC's in a different aircraft of the same group, if the training is conducted in a level C simulator. Because of the experience levels

required in Appendix H for SIC's in this type of training (which is actually initial equipment training) the training may be accomplished in the same manner as PIC upgrade training.

(5) *For SIC Upgrade Training:* FE's upgrading to SIC must complete training in each training event in table 3.2.6.5. FE's upgrading to SIC are not required to manipulate the primary flight controls for the following events, but should receive training which emphasizes duties of the pilot-not-flying. The training events are as follows:

- Steep turns
- Approach and landing with pitch mistrim
- Approach and landing with 50% loss of power
- Approach and landing with flap/slat malfunction

B. *Training Emphasis Considerations.* POI's should ensure that the operator's transition and upgrade training emphasizes the appropriate areas for these categories of training:

(1) *For Transition Training,* emphasis should be on the handling characteristics and the maneuvers and procedures pertinent to the specific aircraft type.

(2) *For Upgrade Training,* emphasis should be on the specific duties and responsibilities pertinent to the crewmember position. Additionally, in the case of an FE upgrading to SIC, maneuver-emphasis training (particularly in approaches and landings) should be included.

TABLE 3.2.6.5.
FLIGHT TRAINING
PIC/SIC TRANSITION AND UPGRADE FLIGHT TRAINING: TRANSPORT AND COMMUTER CATEGORY
AIRPLANES
(FRONT)

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
						VIS	PH I	PH II	PH III	
PREPARATION	Visual Inspection (For aircraft with F/E, use of pictorial display authorized)									X
	Prestart Procedures	A	A	X	X	X	X	X	X	X
	Performance Limitations	X	X	X	X	X	X	X	X	X
SURFACE OPERATION	Pushback			X	X	X	X	X	X	X
	[] Powerback Taxi							X	X	X
	Starting	A	A	X	X	X	X	X	X	X
	Taxi							X	X	X
	Pretakeoff Checks	A	A	X	X	X	X	X	X	X
TAKEOFF	Normal M							X	X	X
	Crosswind							X	X	X
	Rejected M			X	X	X	X	X	X	X
	Power Failure V_1 M					X	X	X	X	X
	Powerplant Failure During Second Segment #					X	X	X	X	X
	[] Lower than Standard Minimum					X	X	X	X	X
CLIMB	Normal			X	X	X	X	X	X	X
	One-engine Inoperative During Climb to En Route Altitude #					X	X	X	X	X
EN ROUTE	Steep Turns PIC			X	X	X	X	X	X	X
	Approaches to Stalls: M (Takeoff Config.) (En Route Config.) (Landing Config.) X* Only if stall warning/stall avoidance provides first first stall indication			X*	X*	X	X	X	X	X
	In-flight Powerplant Shutdown	A	A	X	X	X	X	X	X	X
	In-flight Powerplant Restart		A	X	X	X	X	X	X	X
	High Speed Handling Characteristics					X	X	X	X	X
						X	X	X	X	X
DESCENT	Normal			X	X	X	X	X	X	X
	Maximum Rate					X	X	X	X	X
APPROACHES	VFR Procedures M							X	X	X
	Visual Approach									
	With 50% Loss of Power on One Side PIC M (2 engines inoperative on 3-engine airplanes)					X	X	X	X	X
	With Slat/Flap Malfunction PIC M					X	X	X	X	X
	IFR Precision Approaches M									
	ILS/Normal							X	X	X
	ILS/One-Engine Inoperative					X	X	X	X	X
	[] MLS/Normal							X	X	X
	[] MLS/One-Engine Inoperative					X	X	X	X	X
	[] PAR/Normal			X	X	X	X	X	X	X
	[] PAR/One-Engine Inoperative #					X	X	X	X	X
	IFR Precision Approaches M									
	NDB/Normal			A*	A*	X	X	X	X	X
	VOR/Normal									
	A* At least one nonprecision approach must be accomplished in a level A or higher simulator or the aircraft			A*	A*	X	X	X	X	X
	Nonprecision Approach One Engine Inoperative #					X	X	X	X	X
	[] LOC Backcourse Procedures		A	X	X	X	X	X	X	X
	[] SDF/LDA Procedures		A	X	X	X	X	X	X	X
	[] TACAN Procedures		A	X	X	X	X	X	X	X
	[] ASR Procedures		A	X	X	X	X	X	X	X
	[] RNAV Procedures		A	X	X	X	X	X	X	X
	[] LORAN C Procedures		A	X	X	X	X	X	X	X
	[] Circling Approach M (Simulator must be qualified for training/checking on the circling maneuver)							X	X	X

TABLE 3.2.6.5.—Continued
FLIGHT TRAINING
PIC/SIC TRANSITION AND UPGRADE FLIGHT TRAINING: TRANSPORT AND COMMUTER CATEGORY AIRPLANES
(BACK)

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
						VIS	PH I	PH II	PH III	
APPROACHES (Cont'd)	MISSED APPROACHES M					X	X	X	X	X
	From Precision Approach					X	X	X	X	X
	From Nonprecision Approach					X	X	X	X	X
	With Powerplant Failure					X	X	X	X	X
	NOTE: At least one MAP must be a complete approved procedure. At least one MAP must be with a powerplant failure.									
LANDINGS	Normal							X	X	X
	With Pitch Mistrim PIC					X	X	X	X	X
	From Precision Instrument Approach							X	X	X
	From Precision Instrument Approach With Most Critical Engine Inoperative							X	X	X
	With 50% Loss of Power on One Side PIC (2 engines inoperative on 3-engine airplanes)					X	X	X	X	X
	With Flap/Slat Malfunction					X	X	X	X	X
	Crosswind							X	X	X
	With Manual Reversion/Degraded Control Augmentation					X	X	X	X	X
AFTER LANDING	Parking #							X	X	X
	Emergency Evacuation #			X	X	X	X	X	X	X
OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Holding			X	X	X	X	X	X	X
	Ice Accumulation on Airframe #			X	X	X	X	X	X	X
	Air Hazard Avoidance #				A	A	X	X	X	X
	Windshear/Microburst #					X	X	X	X	X
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE	Pneumatic/Pressurization	A	A	X	X	X	X	X	X	X
	Air Conditioning	A	A	X	X	X	X	X	X	X
	Fuel and Oil	A	A	X	X	X	X	X	X	X
	Electrical	A	A	X	X	X	X	X	X	X
	Hydraulic	A	A	X	X	X	X	X	X	X
	Flight Controls	A	A	X	X	X	X	X	X	X
	Anti-icing and Deicing Systems			X	X	X	X	X	X	X
	Autopilot		A	X	X	X	X	X	X	X
	Flight Management Guidance Systems and/or Automatic or Other Approach & Landing Aids		A	X	X	X	X	X	X	X
	Stall Warning Devices, Stall Avoidance Devices, and Stability Augmentation Systems			X	X	X	X	X	X	X
	Airborne Weather Radar	A	A	X	X	X	X	X	X	X
	Flight Instrument System Malfunction		A	X	X	X	X	X	X	X
	Communications Equipment	A	A	X	X	X	X	X	X	X
	Navigation Systems	A	A	X	X	X	X	X	X	X
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE	Aircraft Fires	A	A	X	X	X	X	X	X	X
	Smoke Control	A	A	X	X	X	X	X	X	X
	Powerplant Malfunctions	A	A	X	X	X	X	X	X	X
	Fuel Jettison	A	A	X	X	X	X	X	X	X
	Electrical, Hydraulic, Pneumatic Systems	A	A	X	X	X	X	X	X	X
	Flight Control Systems Malfunction	A	A	X	X	X	X	X	X	X
	Landing Gear and Flap Systems Malfunction	A	A	X	X	X	X	X	X	X

503. PIC/SIC RECURRENT FLIGHT TRAINING TRANSPORT AND COMMUTER CATEGORY AIRPLANES

A. Required Maneuvers and Procedures. Training in the maneuvers and procedures in table 3.2.6.6., in accordance with the following paragraphs, must be conducted for the satisfactory completion of recurrent flight training.

(1) *FAR Part 135 Recurrent Flight Training (RFT).* FAR Part 135 RFT must be conducted periodically for both PIC's and SIC's, at least once every 12 months. FAR § 135.351(c) specifies that RFT for pilots must include at least, "flight training in the maneuvers or procedures in this subpart, except that satisfactory completion of the check required by FAR § 135.293 (the competency check)...may be substituted for recurrent flight training." The competency check may include any of the maneuvers and procedures currently required for the original issuance of the particular pilot certificate, for the operations authorized, and appropriate to the category, class, and type of aircraft involved. The instrument proficiency check, as specified in FAR § 135.293(c), may be substituted for the competency check. Additionally, there are no provisions in FAR Part 135 that allow recurrent training to substitute for required checks or tests. There are no training appendices in FAR Part 135 containing lists of the required maneuvers and procedures for flight training or checking. Training on the events in the applicable tables in this section meets the FAR Part 135 competency and instrument proficiency check requirements and therefore, the RFT requirements.

NOTE: When training or evaluating the ability of a pilot to control an aircraft on instruments and to navigate without reference to outside cues, the inspector, check airman, or instructor must restrict the pilot's vision to the aircraft's instrument panel. This can only be ensured with the use of an appropriate view-limiting device. When a flight simulator is not available for training or checking, the dilemma is how to safely perform these maneuvers under the "see and be seen" requirements of visual meteorological conditions (VMC) flight and still be able to accurately assess the pilot's ability to control and navigate an aircraft without reference to outside cues. On one hand, the use of a view-limiting device must not restrict the ability of the check airman or other observers to safely clear the area and conduct outside vigilance during all maneuvers. On the other hand, the check airman must be certain that the pilot is not using any outside references. In final analysis, the check or training should not be conducted if the requirements of safety

and test integrity cannot be met (see also volume 5, paragraph 133).

(2) *FAR Part 121 RFT.* FAR Part 121 RFT is training that must be conducted for PIC's once each 6 months and for SIC's once each 12 months, and must include training on the maneuvers and procedures listed in Appendix F of FAR Part 121. Levels B, C, and D flight simulators qualify for "training and checking to proficiency" on all the maneuvers and procedures required for RFT by FAR Part 121. RFT can always be conducted in an airplane. A proficiency check (FAR § 121.441) may be substituted for RFT.

(3) *FAR Part 121 Level-A RFT.* Level-A RFT is training which is conducted in a visual simulator. Level-A RFT is referenced in several different ways in FAR Part 121. The following are examples: "A course of training in an airplane simulator" (FAR § 121.409(b)); "flight training program approved by the administrator" (FAR § 121.427(d)(1)); and "the approved simulator course of training" (FAR §§ 121.433(c)(2) and 121.441(a)). For the purpose of standardization and mutual understanding, the term "level-A recurrent flight training" or "level-A RFT" should be used in reference to this type of training when it is conducted entirely in a visual simulator. Level A flight simulators are not qualified to be used for "training to proficiency" on certain maneuvers listed in Appendix F (such as takeoffs and landings). However, level A flight simulators can be used for training and practice on the procedures used to accomplish these maneuvers. These maneuvers are annotated by a "C" in the Recurrent Flight Training Maneuvers and Procedures Table (table 3.2.6.6.). Level-A RFT may be substituted for alternate periods of RFT (required by FAR § 121.433(c)(2)) or for alternate proficiency checks (required by FAR § 121.441(e)), provided the person being trained is evaluated by a check airman during the subsequent proficiency check (for PIC's once each 12 months; for SIC's once each 24 months). The proficiency check may be conducted in a level A (visual) simulator, provided the person being checked is evaluated during the conduct of two landings on the line (or other check) by a check airman (or, for SIC's, by a line PIC). The entire proficiency check (without the landings on the line requirement) may be conducted in a level B, C, or D simulator.

(4) *FAR Part 121 Requalification Flight Training.* Requalification flight training is conducted specifically to restore a previously line qualified crew member to line qualified status. To be eligible for this training, a crewmember must have previously been qualified in the specific aircraft type and duty position and have subsequently lost his/her qualification.

B. *Training Emphasis Considerations.* Operators should develop RFT and Level-A RFT curriculum segments which serve to maximize training on certain maneuvers and procedures. An airman's competency to function in his assigned duty position is evaluated during an annual proficiency check (or a competency check). During that check, at least the events required by FAR Part 121, Appendix F (for FAR Part 121 operators) and any of the events required for the original issuance of the particular pilot certificate involved (for FAR Part 135 operators) must be accomplished. The RFT curriculum outline should address all the required training events listed in table 3.2.6.6. However, during RFT or level-A RFT, specific training on every event is unnecessary unless it is needed for maintaining pilot proficiency on particular events. It is national direction and guidance that during periods of RFT or level-A RFT, that training emphasis should

be on those events or other maneuvers or procedures not normally encountered during routine line operations, such as abnormal or emergency procedure training or windshear training. Additionally, training on new or revised maneuvers or procedures, new equipment, or other similar areas is ideally suited for periods of RFT or level-A RFT. Time should be allotted to conduct training in maneuvers or procedures the airman wishes to practice, or in certain operational areas in which deficiencies have surfaced during proficiency or line checks, indicating a need for additional training.

NOTE: Even though all of the maneuvers and procedures may not be accomplished during RFT or level-A RFT, the RFT curriculum segment outline should address all of the required training events listed in table 3.2.6.6.

**TABLE 3.2.6.6. FLIGHT TRAINING
PIC/SIC RECURRENT AND REQUALIFICATION FLIGHT TRAINING: TRANSPORT AND COMMUTER
CATEGORY AIRPLANES (FRONT)**

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
						VIS	PH I	PH II	PH III	
PREPARATION	Visual Inspection (Use of pictorial display authorized)									X
	Pretaxi Procedures		X	X	X	X	X	X	X	X
	Performance Limitations	A	A	X	X	X	X	X	X	X
SURFACE OPERATION	Pushback	A	A	X	X	X	X	X	X	X
	[] Powerback Taxi					X	X	X	X	X
	Starting			X	X	X	X	X	X	X
	Taxi					C	C	X	X	X
	Pretakeoff Checks	A	A	X	X	X	X	X	X	X
TAKEOFF	Normal M					C	C	X	X	X
	Crosswind					C	C	X	X	X
	Rejected M			X	X	X	X	X	X	X
	Power Failure V ₁ M					X	X	X	X	X
	Powerplant Failure During Second Segment #					X	X	X	X	X
	[] Lower than Standard Minimum					X	X	X	X	X
CLIMB	Normal			X	X	X	X	X	X	X
	One-engine Inoperative During Climb to En Route Altitude #					X	X	X	X	X
EN ROUTE	Steep Turns PIC			X	X	X	X	X	X	X
	Approaches to Stalls: M (Takeoff Config.) (En Route Config.) (Landing Config.) X* Only if stall warning/stall avoidance provides first stall indication			X*	X*	X	X	X	X	X
	In-flight Powerplant Shutdown	A	A	X	X	X	X	X	X	X
	In-flight Powerplant Restart		A	X	X	X	X	X	X	X
	High Speed Handling Characteristics					X	X	X	X	X
DESCENT	Normal			X	X	X	X	X	X	X
	Maximum Rate			X	X	X	X	X	X	X
APPROACHES	VFR Procedures Normal					C	X	X	X	X
	With 50% Loss of Power on One-Engine PIC M (2 engines inoperative on 3-engine airplanes)					X	X	X	X	X
	With Slat/Flap Malfunction PIC M					X	X	X	X	X
	IFR Precision Approaches M ILS/Normal					X	X	X	X	X
	ILS/One-Engine Inoperative					C	X	X	X	X
	[] MLS/Normal					X	X	X	X	X
	[] MLS/One-Engine Inoperative					C	X	X	X	X
	[] PAR/Normal			X	X	X	X	X	X	X
	[] PAR/One-Engine Inoperative #					X	X	X	X	X
	IFR Precision Approaches M NDB/Normal			A*	A	X	X	X	X	X
	VOR/Normal A* At least one nonprecision approach must be accomplished in a level A or higher simulator or the aircraft			A*	A	X	X	X	X	X
	Nonprecision Approach One Engine Inoperative #					X	X	X	X	X
	[] LOC Backcourse Procedures		A	X	X	X	X	X	X	
	[] SDF/LDA Procedures		A	X	X	X	X	X	X	X
	[] TACAN Procedures		A	X	X	X	X	X	X	X
	[] ASR Procedures		A	X	X	X	X	X	X	X
	[] RNAV Procedures		A	X	X	X	X	X	X	X
	[] GPS Procedures		A	X	X	X	X	X	X	X
	[] Circling Approach M (Simulator must be qualified for training/checking on the circling maneuver)					X	X	X	X	X

TABLE 3.2.6.6. Continued
FLIGHT TRAINING
PIC/SIC RECURRENT AND REQUALIFICATION FLIGHT TRAINING: TRANSPORT AND COMMUTER
CATEGORY AIRPLANES (BACK)

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
						VIS	PH I	PH II	PH III	
APPROACHES (Cont'd)	Missed Approaches M									
	From Precision Approach					X	X	X	X	X
	From Nonprecision Approach					X	X	X	X	X
	With Powerplant Failure					X	X	X	X	X
LANDINGS	Normal					C	X	X	X	X
	Rejected Landing					C	X	X	X	X
	From Precision Instrument Approach					X	X	X	X	X
	From Precision Instrument Approach With Most Critical Engine Inoperative					X	X	X	X	X
	With 50% Loss of Power on One Side PIC (2 engines inoperative on 3-engine airplanes)					X	X	X	X	X
	Crosswind					A	X	X	X	X
AFTER LANDING	Parking #					X	X	X	X	X
	Emergency Evacuation #			X	X	X	X	X	X	X
OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Holding			X	X	X	X	X	X	X
	Ice Accumulation on Airframe #				X	X	X	X	X	X
	Air Hazard Avoidance #					A	X	X	X	X
	Windshear/Microburst #					X	X	X	X	X
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE	Pneumatic/Pressurization	A	A	X	X	X	X	X	X	X
	Air Conditioning	A	A	X	X	X	X	X	X	X
	Fuel and Oil	A	A	X	X	X	X	X	X	X
	Electrical	A	A	X	X	X	X	X	X	X
	Hydraulic	A	A	X	X	X	X	X	X	X
	Flight Controls	A	A	X	X	X	X	X	X	X
	Anti-icing and Deicing Systems			X	X	X	X	X	X	X
	Autopilot			X	X	X	X	X	X	X
- Normal	Flight Management Guidance Systems and/or Automatic or Other Approach & Landing Aids		A	X	X	X	X	X	X	X
- Abnormal	Stall Warning Devices, Stall Avoidance Devices, and Stability Augmentation Systems			X	X	X	X	X	X	X
- Alternate	Airborne Weather Radar	A	A	X	X	X	X	X	X	X
	Flight Instrument System Malfunction	A	A	X	X	X	X	X	X	X
	Communications Equipment	A	A	X	X	X	X	X	X	X
	Navigation Systems	A	A	X	X	X	X	X	X	X
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE	Aircraft Fires	A	A	X	X	X	X	X	X	X
	Smoke Control	A	A	X	X	X	X	X	X	X
	Powerplant Malfunctions	A	A	X	X	X	X	X	X	X
	Fuel Jettison	A	A	X	X	X	X	X	X	X
	Electrical, Hydraulic, Pneumatic Systems	A	A	X	X	X	X	X	X	X
	Flight Control Systems Malfunction	A	A	X	X	X	X	X	X	X
-Emergency	Landing Gear and Flap Systems Malfunction	A	A	X	X	X	X	X	X	X

505. FE INITIAL EQUIPMENT, INITIAL NEW-HIRE, TRANSITION AND RECURRENT FLIGHT TRAINING: TRANSPORT CATEGORY AIRPLANES.

A. *Training Required for Initial Issuance of an FE Certificate.* All applicants for a flight engineer certificate with the **initial** class rating must satisfy one of the seven aeronautical experience and or training requirements specified in FAR § 63.37.

(1) FAR § 63.37 (b)(1),(2),(3), and (4) require, in addition to other specific requirements, that an applicant receive 5 hours of flight training in the duties of a flight engineer. This training must be accomplished in an airplane, in flight. There are no provisions for the substitution of simulators or flight training devices for any part of these 5 hours of flight training. These 5 hours of flight training may not be acquired during revenue operations conducted under FAR Part 121.

(2) FAR § 63.37 (b)(5),(6), and (7) are alternative methods for satisfying the aeronautical experience and/or training requirements of FAR Part 63. An applicant who meets the aeronautical experience requirements in subparagraphs (b)(5) or (b)(6) is eligible for an initial flight engineer certification check without any flight training (including the 5-hour airplane training requirement). FAR § 63.37 (b)(7) allows the successful completion of an approved flight engineer ground and flight course of instruction as provided in FAR Part 63, Appendix C, to satisfy the aeronautical experience requirements. If a student for initial issuance of a flight engineer certificate uses the training received from a FAR Part 121 operator to meet the aeronautical experience requirements of FAR § 63.37, that operator's flight engineer training course must be approved under FAR § 63.43, and FAR §§ 121.419 and 121.425.

NOTE: When an operator's FE training curriculum meets the requirements of this handbook and is approved under FAR Part 121, it also meets the requirements of FAR Part 63. The operator may obtain approval of that curriculum under FAR § 63.43 by submitting a letter requesting approval in accordance with the provisions of that regulation. A POI must approve or deny the request by letter.

(3) Training under FAR Part 63, Appendix C includes at least 10 hours of flight instruction. Appendix C is the only section in FAR Part 63 that permits the use of flight training devices and flight simulators. In accordance with Part 63, Appendix C (a)(3)(iv) an operator may reduce the flight training

requirement to 5 hours of actual airplane time by substituting time in flight simulators and/or flight training devices for a total of at least 10 hours of flight training. It is important, however, to note that simulators may be substituted on a 2-to-1 basis, and training devices on a 3-to-1 basis, for actual airplane time. For example, for an operator to be permitted a reduction to 5 hours of airplane training, that operator must provide at least 10 hours of simulator time (2-to-1) or 15 hours of training device time (3-to-1), or any other combination thereof which, when added to the 5 hours of airplane training, meets the 10 hour Appendix C flight training requirement.

(4) FAR Part 63, Appendix C (a)(iv)(b) permits a flight engineer student holding at least a commercial pilot certificate with an instrument rating to substitute either flight simulator time or a combination of flight simulator and flight training device time for up to the full 10 hours of required airplane flight time. The 2-to-1 and 3-to-1 provisions still apply with an additional restriction that a maximum of 15 hours flight training device time may be substituted. For example, an operator may substitute 20 hours of flight simulator time (2:1 = 10 hours of airplane flight training) for the total 10-hour Appendix C airplane flight training requirement. Another example is an operator may substitute 10 hours of simulator time (2:1 = 5 hours of airplane flight training) plus a maximum of 15 hours of training device time (3:1 = 5 hours of airplane flight training) for meeting the total 10-hour Appendix C airplane flight training requirement. The purpose of the 15-hour training device limitation is to ensure a certain amount of the flight training will include a full crew-complement. It is important to note that substitution of simulator and/or training devices for airplane training is only permitted under an FAR Part 63, Appendix C program (as discussed in this subparagraph and subparagraph A.(3)). This provision should not be confused with FAR § 63.37 (b)(4) which permits a student holding a commercial pilot certificate with an instrument rating and who has received at least 5 hours of airplane flight training (no simulator/training device substitution permitted), to qualify for a flight engineer check. Therefore, if an applicant with a commercial pilot certificate and instrument rating attends a FAR Part 63, Appendix C school, the applicant can use FAR § 63.37 (b)(7) to satisfy the experience requirement, and can take advantage of the simulator and training device substitution provisions.

B. *FE Transition Flight Training.* A flight engineer employed by a FAR Part 121 operator who transitions from one airplane to another must complete a transition flight training curriculum segment approved under FAR Part 121. This training is not approved or conducted within the context of

FAR Part 63. The use of flight training devices, flight simulators, or aircraft, for accomplishing training events must be proposed by the operator and approved by the POI.

NOTE: Flight engineer applicants who qualify under the ATA exemption number 4901 may receive the normal procedures portion of the initial certification check in a “flight engineer simulator.” A flight engineer simulator, as defined in that exemption is the equivalent of a level 6 training device or higher, or any level flight simulator. The definition does not require motion for visual systems. This exemption permits compliance with FAR § 63.39(b)(2), which requires the “normal” procedures portion of the certification check to be accomplished in the flight engineer simulator rather than in an actual aircraft. For further explanation, see volume 5, paragraph 245, Flight Engineer Certificate and Class Ratings.

C. *Required Maneuvers and Procedures.* Training in the maneuvers and procedures in table 3.2.6.7. must

be conducted for satisfactory completion of initial new-hire, initial equipment, transition or recurrent training, for previously certificated flight engineers and for the initial certification of flight engineers. Training for these maneuvers and procedures must include training in normal, abnormal, alternate, and emergency procedures, as appropriate.

D. *Training Emphasis Considerations.* A POI should ensure that the operator’s FE flight training emphasizes the appropriate areas for these categories of training:

(1) *For Initial New-Hire Training,* emphasis should be on areas involving crew concept, duties, responsibilities, systems integration concepts, and company procedures.

(2) *For Transition and Initial Equipment Training,* emphasis should be on the systems and procedures that pertain to the specific aircraft type.

(3) *For Recurrent Training,* emphasis should be on new or revised maneuvers or procedures that are pertinent to line operations.

TABLE 3.2.6.7. FLIGHT TRAINING
F/E INITIAL EQUIPMENT, INITIAL NEW-HIRE, TRANSITION AND RECURRENT FLIGHT TRAINING

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
						VIS	PH I	PH II	PH III	
PREPARATION	Airplane Preflight	X	X	X	X	X	X	X	X	X
	<ul style="list-style-type: none"> Logbook Procedures Safety Checks Cabin/Interior Exterior Walkaround M Servicing/Deicing Use of Oxygen (PICTORIAL DISPLAY)									
GROUND OPERATIONS	Performance Data	X	X	X	X	X	X	X	X	X
	<ul style="list-style-type: none"> T/O LND Data Airport Analysis WT & Balance 									
	Use of Checklist	X	X	X	X	X	X	X	X	X
	<ul style="list-style-type: none"> Panel Setup 									
	Starting	X	X	X	X	X	X	X	X	X
TAKEOFF	<ul style="list-style-type: none"> External PWR External Air APU 									
	Communications	X	X	X	X	X	X	X	X	X
	<ul style="list-style-type: none"> Station Procedures ACARS 									
	Taxi	X	X	X	X	X	X	X	X	X
CLIMB	Powerplant Control		X	X	X	X	X	X	X	X
	Fuel Management	X	X	X	X	X	X	X	X	X
	Pressurization		X	X	X	X	X	X	X	X
	Electrical System	X	X	X	X	X	X	X	X	X
	Air Conditioning	X	X	X	X	X	X	X	X	X
	Flight Controls		X	X	X	X	X	X	X	X
EN ROUTE	Other Systems	X	X	X	X	X	X	X	X	X
	Powerplant Operation		X	X	X	X	X	X	X	X
	Fuel Management	X	X	X	X	X	X	X	X	X
	Performance Management		X	X	X	X	X	X	X	X
	High Altitude Performance		X	X	X	X	X	X	X	X
DESCENT	Other Systems Operation	X	X	X	X	X	X	X	X	X
	Powerplant Operation		X	X	X	X	X	X	X	X
	Other Systems Operations	X	X	X	X	X	X	X	X	X
APPROACH	Performance Management	X	X	X	X	X	X	X	X	X
	Landing Data	X	X	X	X	X	X	X	X	X
	Landing Gear Operation	X	X	X	X	X	X	X	X	X
	Flat/Slat/Spoiler Operation		X	X	X	X	X	X	X	X
LANDINGS	Approach Monitoring M		X	X	X	X	X	X	X	X
	Powerplant Operation		X	X	X	X	X	X	X	X
	Aircraft Configuration		X	X	X	X	X	X	X	X
	System Operation	X	X	X	X	X	X	X	X	X
PROCEDURES DURING ANY GROUND OR AIRBORNE PHASE	Emergency Evacuation			X	X	X	X	X	X	X
	Cockpit Equipment			X	X	X	X	X	X	X
	Flap/Slats/Gear		X	X	X	X	X	X	X	X
	Powerplant		X	X	X	X	X	X	X	X
	Pressurization		X	X	X	X	X	X	X	X
	Pneumatic	X	X	X	X	X	X	X	X	X

TABLE 3.2.6.7. FLIGHT TRAINING
F/E INITIAL EQUIPMENT, INITIAL NEW-HIRE, TRANSITION AND RECURRENT FLIGHT TRAINING

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
						VIS	PH I	PH II	PH III	
PROCEDURES (Cont'd) - Normal - Abnormal - Alternate - Emergency	Air Conditioning	X	X	X	X	X	X	X	X	X
	Fuel and Oil	X	X	X	X	X	X	X	X	X
	Electrical	X	X	X	X	X	X	X	X	X
	Hydraulic	X	X	X	X	X	X	X	X	X
	Flight Controls		X	X	X	X	X	X	X	X
	Anti-Icing & Deicing		X	X	X	X	X	X	X	X
	Other Checklist Procedures	X	X	X	X	X	X	X	X	X

Note: F/E Applicants for initial Certification must complete the flight simulator and/or training device training hours as described in subparagraphs A(3) and (4) of this paragraph 505.

507. PIC/SIC FLIGHT TRAINING (ALL TRAINING CATEGORIES): MULTIENGINE GENERAL PURPOSE AIRPLANES.

A. *Required Maneuvers and Procedures.* Training in the maneuvers and procedures table 3.2.6.8. must be conducted for satisfactory completion of each category of flight training. Those training events annotated with a “SEA” symbol are only required for those operators engaged in seaplane operations.

(1) PIC’s must complete training in each training event in this table.

(2) SIC’s must complete training in each training event in this table. SIC training in the following events does not require manipulation of the primary aircraft controls but should emphasize duties of the pilot-not-flying:

- Approach and landing with pitch mistrim
- Approach and landing with 50% loss of power on one side
- Approach and landing with flap/slat malfunction
- Steep turns

B. *Training Emphasis Considerations.* A POI should ensure that the operator’s flight training emphasizes the appropriate areas for these categories of training:

(1) *For Initial New-Hire Training,* emphasis should be on specific company procedures.

(2) *For Transition Training,* emphasis should be on the handling characteristics and the maneuvers and procedures pertinent to the specific aircraft type.

(3) *For Upgrade Training,* emphasis should be on the specific duties and responsibilities pertinent to the crew-member position.

(4) *For Recurrent Training,* emphasis should be on new or revised maneuvers or procedures pertinent to line operations.

C. *Part 135 Recurrent Flight Training (RFT).* Recurrent flight training must be conducted periodically for both PIC’s and SIC’s, at least once every 12 months. FAR § 135.351(c) specifies that recurrent flight training for pilots must include at least “...flight training in the maneuvers or procedures in this subpart except that satisfactory completion of the check required by FAR § 135.293 (the competency check)... may be substituted for recurrent flight training.” The competency check may include any of the maneuvers and procedures currently required for the original issuance of the particular pilot certificate, for the operations authorized, and appropriate for the category, class, and type of aircraft involved. The instrument proficiency check as specified in FAR § 135.293(c), may be substituted for the competency check. Additionally, there are no provisions in FAR Part 135 which allow recurrent flight training to substitute for required checks or tests. There are no training appendices in FAR Part 135 containing lists of the required maneuvers and procedures for flight training or checking. Training on the events in the applicable tables in this section, however, does meet the FAR Part 135 competency and instrument proficiency check requirements and, therefore, the recurrent flight training requirements.

**TABLE 3.2.6.8.
FLIGHT TRAINING**

PIC/SIC TRAINING (ALL TRAINING CATEGORIES): MULTIENGINE GENERAL PURPOSE AIRPLANES

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
						VIS	PH I	PH II	PH III	
PREPARATION	Visual Inspection									X
	Pretaxi Procedures		X	X	X	X	X	X	X	X
	Performance Limitations	X	X	X	X	X	X	X	X	X
SURFACE OPERATION	Cockpit Management			X	X	X	X	X	X	X
	Securing Cargo									X
	Starting	X	X	X	X	X	X	X	X	X
	Taxi	X				X	X	X	X	X
	[] Powerback Taxi						X	X	X	X
	Step Turns SEA									X
	Sailing SEA									X
	Pretakeoff Checks			X	X	X	X	X	X	X
TAKEOFF	Normal M						X	X	X	X
	Crosswind						X	X	X	X
	Short/Soft Field M								X	X
	Glassy/Rough Water SEA								X	X
	VMC Demonstration and Recovery				X	X	X	X	X	X
	Powerplant Failure Before VMC (Rejected)			X	X	X	X	X	X	X
	Powerplant Failure After VMC				X	X	X	X	X	X
	[] Lower than Standard Minimum				X	X	X	X	X	X
CLIMB	Normal			X	X	X	X	X	X	X
	One-Engine Inoperative #				X	X	X	X	X	X
EN ROUTE	Steep Turns			X	X	X	X	X	X	X
	Approaches to Stalls: M (Takeoff Config.) (En Route Config.) (Landing Config.) X* Only if stall warning/stall avoidance provides first first stall indication			X*	X*	X	X	X	X	X
	Powerplant Shutdown and Restart			X	X	X	X	X	X	X
	Slow Speed Handling Characteristics			X	X	X	X	X	X	X
	With a Powerplant Inoperative			X	X	X	X	X	X	X
DESCENT	Normal			X	X	X	X	X	X	X
	Maximum Rate			X	X	X	X	X	X	X
APPROACHES	VFR Procedures M Normal						X	X	X	X
	With 50% Loss of Power on One Side PIC M					X	X	X	X	X
	With Slat/Flap Malfunction PIC M					X	X	X	X	X
	IFR Precision Approaches M ILS/Normal						X	X	X	X
	ILS/One-Engine Inoperative						X	X	X	X
	[] MLS/Normal						X	X	X	X
	[] MLS/One-Engine Inoperative						X	X	X	X
	[] PAR/Normal						X	X	X	X
	[] PAR/One-Engine Inoperative						X	X	X	X
	IFR Nonprecision Approaches M NDB/Normal			A*	A*	X	X	X	X	X
	VOR/Normal A* At least one VOR or NDB approach must be accomplished in a level A or higher simulator or the aircraft			A*	A*	X	X	X	X	X
	Nonprecision Approach One Engine Inoperative #					X	X	X	X	X
	[] LOC Backcourse Procedures		A	X	X	X	X	X	X	X
	[] SDF/LDA Procedures		A	X	X	X	X	X	X	X
	[] TACAN Procedures		A	X	X	X	X	X	X	X
	[] ASR Procedures		A	X	X	X	X	X	X	X

TABLE 3.2.6.8.—Continued
FLIGHT TRAINING
PIC/SIC FLIGHT TRAINING (ALL CATEGORIES):MULTIENGINE GENERAL PURPOSE AIRPLANES

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
						VIS	PH I	PH II	PH III	
APPROACHES (Cont'd)	[] RNAV Procedures		A	X	X	X	X	X	X	X
	[] LORAN C Procedures		A	X	X	X	X	X	X	X
	[] Circling Approach M (Simulator must be qualified for training/checking on the circling maneuver)							X	X	X
	MISSED APPROACHES M From Precision Approach					X	X	X	X	X
	From Nonprecision Approach					X	X	X	X	X
	NOTE: At least one MAP must be a complete approved procedure.									
	With Powerplant Failure					X	X	X	X	X
LANDINGS	Normal							X	X	X
	With Pitch Mistrim PIC					X	X	X	X	X
	From Precision Instrument Approach							X	X	X
	From Precision Instrument Approach With Most Critical Engine Inoperative					X	X	X	X	X
	With 50% Loss of Power on One Side PIC					X	X	X	X	X
	With Flap/Slat Malfunction PIC					X	X	X	X	X
	Crosswind							X	X	X
	Short/Soft Field							X	X	X
	Glassy/Rough Water SEA							X	X	X
	With Manual Reversion/Degraded Control Augmentation					X	X	X	X	X
AFTER LANDING	Docking, Mooring and Ramping SEA								X	X
	Parking #						X	X	X	X
	Emergency Evacuation #			X	X	X	X	X	X	X
OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Holding			X	X	X	X	X	X	X
	Ice Accumulation on Airframe #				X	X	X	X	X	X
	Air Hazard Avoidance #					A	A	X	X	X
	Windshear/Microburst #					X	X	X	X	X
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE	Pneumatic/Pressurization	A	A	X	X	X	X	X	X	X
	Air Conditioning	A	A	X	X	X	X	X	X	X
	Fuel and Oil	A	A	X	X	X	X	X	X	X
	Electrical	A	A	X	X	X	X	X	X	X
	Hydraulic	A		X	X	X	X	X	X	X
	Flight Controls	A		X	X	X	X	X	X	X
	Anti-icing and Deicing Systems			X	X	X	X	X	X	X
	Autopilot		A	X	X	X	X	X	X	X
	- Normal Flight Management Guidance Systems and/or Automatic or Other Approach & Landing Aids		A	X	X	X	X	X	X	X
	- Abnormal Stall Warning Devices, Stall Avoidance Devices, and Stability Augmentation Systems			X	X	X	X	X	X	X
- Alternate	Airborne Weather Radar	A	A	X	X	X	X	X	X	X
	Flight Instrument System Malfunction		A	X	X	X	X	X	X	X
	Communications Equipment	A	A	X	X	X	X	X	X	X
	Navigation Systems	A	A	X	X	X	X	X	X	X
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE	Aircraft Fires	A	A	X	X	X	X	X	X	X
	Smoke Control	A	A	X	X	X	X	X	X	X
	Powerplant Failure/Fire	A	A	X	X	X	X	X	X	X
	Electrical, Hydraulic, Pneumatic Systems	A	A	X	X	X	X	X	X	X
	Flight Control Systems Malfunction	A	A	X	X	X	X	X	X	X
	Landing Gear and Flap Systems Malfunction	A	A	X	X	X	X	X	X	X
	- Emergency Air Hazard Avoidance #					X	X	X	X	X
	Windshear/Microburst M				X	X	X	X	X	X

509. PIC/SIC FLIGHT TRAINING (ALL TRAINING CATEGORIES): SINGLE-ENGINE AIRPLANES.

A. *Required Maneuvers and Procedures.* Training in the maneuvers and procedures table 3.2.6.9. must be conducted for satisfactory completion of each category of flight training. Those training events annotated with a “SEA” symbol are only required for operators engaged in seaplane operations.

(1) PIC’s must complete training in each training event in this table.

(2) SIC’s must complete training in each training event in this table. SIC training in the following events does not require manipulation of the primary aircraft controls but should emphasize duties of the pilot-not-flying:

- Approach and landing with pitch mistrim
- Steep turns

B. *Training Emphasis Considerations.* A POI should ensure that the operator’s flight training emphasizes the appropriate areas for these categories of training.

- For initial new-hire training, emphasis should be on specific company procedures
- For transition training, emphasis should be on the handling characteristics and the maneuvers and procedures pertinent to the specific aircraft type

- For upgrade training, emphasis should be on the specific duties and responsibilities pertinent to the crewmember position
- For recurrent training, emphasis should be on new or required maneuvers or procedures pertinent to line operations

C. *Part 135 Recurrent Flight Training (RFT).* *Recurrent flight training must be conducted periodically for both PIC’s and SIC’s, at least once every 12 months.* FAR § 135.351(c) specifies that recurrent flight training for pilots must include at least “...flight training in the maneuvers or procedures in this subpart except that satisfactory completion of the check required by FAR § 135.293 (the competency check)... may be substituted for recurrent flight training”. The competency check may include any of the maneuvers and procedures currently required for the original issuance of the particular pilot certificate, for the operations authorized, and appropriate to the category, class, and type of aircraft involved. The instrument proficiency check, as specified in FAR § 135.293(c), may be substituted for the competency check. Additionally, there are no provisions in FAR Part 135 which allow recurrent flight training to substitute for required checks or tests. There are no training appendices in FAR Part 135 containing lists of the required maneuvers and procedures for flight training or checking. Training on the events in the applicable tables in this section, however, does meet the FAR Part 135 competency and instrument proficiency check requirements and therefore, the recurrent flight training requirements.

TABLE 3.2.6.9.
FLIGHT TRAINING
PIC/SIC FLIGHT TRAINING (ALL TRAINING CATEGORIES): SINGLE-ENGINE AIRPLANES

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
						VIS	PH I	PH II	PH III	
PREPARATION	Visual Inspection									X
	Pretaxi Procedures		X	X	X	X	X	X	X	X
	Performance Limitations	X	X	X	X	X	X	X	X	X
SURFACE OPERATION	Cockpit Management			X	X	X	X	X	X	X
	Securing Cargo									X
	Starting	X	X	X	X	X	X	X	X	X
	Taxi					X	X	X	X	X
	[] Powerback Taxi						X	X	X	X
	Step Turns SEA									X
	Sailing SEA									X
	Pretakeoff Checks			X	X	X	X	X	X	X
TAKEOFF	Normal M						X	X	X	X
	Crosswind						X	X	X	X
	Rejected M			X	X	X	X	X	X	X
	Short/Soft Field M								X	X
	Glassy/Rough Water SEA								X	X
CLIMB	Normal			X	X	X	X	X	X	X
	Obstacle				X	X	X	X	X	X
EN ROUTE	Steep Turns PIC			X	X	X	X	X	X	X
	Approaches to Stalls: M (Takeoff Config.) (En Route Config.) (Landing Config.) X* Only if stall warning/stall avoidance provides first first stall indication			X*	X	X	X	X	X	X
	Slow Speed Handling Characteristics			X	X	X	X	X	X	X
DESCENT	Normal			X	X	X	X	X	X	X
	Maximum Rate			X	X	X	X	X	X	X
APPROACHES	VFR Procedures M									
	Visual Approach						X	X	X	X
	Accuracy						X	X	X	X
	IFR Precision Approaches M							X	X	X
	ILS						X			
	[] MLS						X	X	X	X
	[] PAR						X	X	X	X
	IFR Nonprecision Approaches M									
	NDB			A*	A*	X	X	X	X	X
	VOR									
	A* At least one nonprecision approach must be accomplished in a level A or higher simulator or the aircraft			A*	A*	X	X	X	X	X
	[] LOC Backcourse		A	X	X	X	X	X	X	X
	[] SDF/LDA Procedures		A	X	X	X	X	X	X	X
	[] TACAN Procedures		A	X	X	X	X	X	X	X
	[] ASR Procedures		A	X	X	X	X	X	X	X
	[] RNAV Procedures		A	X	X	X	X	X	X	X
	[] LORAN C Procedures		A	X	X	X	X	X	X	X
	[] Circling Approach M (Simulator must be qualified for training/checking on the circling maneuver)							X	X	X
	MISSED APPROACHES M									
	From Precision Approach					X	X	X	X	X
	From Nonprecision Approach					X	X	X	X	X
	NOTE: At least one MAP must be a complete approved procedure.									

TABLE 3.2.6.9. - Continued
FLIGHT TRAINING
PIC/SIC FLIGHT TRAINING (ALL TRAINING CATEGORIES): SINGLE-ENGINE AIRPLANES

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
						VIS	PH I	PH II	PH III	
LANDINGS	Normal							X	X	X
	Spot							X	X	X
	With Simulated Powerplant Failure							X	X	X
	With Pitch Mistrim PIC					X	X	X	X	X
	From Precision Instrument Approach							X	X	X
	Crosswind							X	X	X
	Short/Soft Field								X	X
	Glassy/Rough Water SEA								X	X
AFTER LANDING	Docking, Mooring and Ramping SEA								X	X
	Parking #						X	X	X	X
	Emergency Evacuation #			X	X	X	X	X	X	X
OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Holding			X	X	X	X	X	X	X
	Ice Accumulation on Airframe #					X	X	X	X	X
	Air Hazard Avoidance #					X	X	X	X	X
	Windshear/Microburst #				X	X	X	X	X	X
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE	Pneumatic/Pressurization	A	A	X	X	X	X	X	X	X
	Air Conditioning	A	A	X	X	X	X	X	X	X
	Fuel and Oil	A	A	X	X	X	X	X	X	X
	Electrical	A	A	X	X	X	X	X	X	X
	Hydraulic	A	A	X	X	X	X	X	X	X
	Flight Controls	A	A	X	X	X	X	X	X	X
	Anti-icing and Deicing Systems			X	X	X	X	X	X	X
	Autopilot		A	X	X	X	X	X	X	X
	Flight Management Guidance Systems and/or Automatic or Other Approach & Landing Aids		A	X	X	X	X	X	X	X
	Stall Warning Devices/Stall Avoidance Devices			X	X	X	X	X	X	X
	Airborne Weather Radar	A	A	X	X	X	X	X	X	X
	Flight Instrument System Malfunctions		A	X	X	X	X	X	X	X
	Communications Equipment	A	A	X	X	X	X	X	X	X
	Navigation Systems	A	A	X	X	X	X	X	X	X
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE	Aircraft Fires	A	A	X	X	X	X	X	X	X
	Smoke Control	A	A	X	X	X	X	X	X	X
	Powerplant Malfunctions	A	A	X	X	X	X	X	X	X
	Electrical, Hydraulic, Pneumatic Systems	A	A	X	X	X	X	X	X	X
	Flight Control Systems Malfunction	A	A	X	X	X	X	X	X	X
	Landing Gear and Flap Systems Malfunction	A	A	X	X	X	X	X	X	X

511. PIC/SIC FLIGHT TRAINING (ALL TRAINING CATEGORIES): HELICOPTERS.

A. *Required Maneuvers and Procedures.* Training in the maneuvers and procedures table 3.2.6.10. must be conducted for satisfactory completion of each category of flight training. Those training events annotated with a “SEA” symbol are only required for an operator engaged in water operations.

(1) PIC’s must complete training in each training event in this table.

(2) SIC’s must complete training in each training event in this table. SIC training in the following events does not require manipulation of the primary aircraft controls but should emphasize the duties of the pilot-not-flying:

- Category “A” vertical and/or edge takeoffs and landings
- Approach and landing with anti-torque malfunctions

NOTE: The levels of training devices and/or simulators to be used for the training events listed in table 3.2.6.10. are currently under development.

B. *Training Emphasis Considerations.* A POI should ensure that the operator’s flight training emphasizes the appropriate areas for these categories of training:

- For initial new-hire training, emphasis should be on specific company procedures
- For transition training, emphasis should be on the handling characteristics and the maneuvers and procedures pertinent to the specific aircraft type
- For upgrade training, emphasis should be on the specific duties and responsibilities pertinent to the crewmember position

- For recurrent training, emphasis should be on new or revised maneuvers or procedures pertinent to line operations.

C. *FAR Part 135 Recurrent Flight Training (RFT).* Recurrent flight training must be conducted periodically for both PIC’s and SIC’s, at least once every 12 months. FAR § 135.351(c) specifies that recurrent flight training for pilots must include at least, “...flight training in the maneuvers or procedures in this subpart except that satisfactory completion of the check required by FAR § 135.293 (the competency check)... may be substituted for recurrent flight training.” The competency check may include any of the maneuvers and procedures currently required for the original issuance of the particular pilot certificate, for the operations authorized, and appropriate to the category, class, and type of aircraft involved. The instrument proficiency check, as specified in FAR § 135.293(c), may be substituted for the competency check. Additionally, there are no provisions in FAR Part 135 which allow recurrent FAR Part 135 containing lists of the required maneuvers and procedures for flight training or checking. Training on the events in the applicable tables in this section, however, does meet the FAR Part 135 competency and instrument proficiency check requirements and therefore, the recurrent flight training requirements.

D. *Helicopter Flight Training Device and Flight Simulator Usage.* The criteria for the use of helicopter flight training devices and flight simulators are currently under development. Several helicopter training devices and simulators have been individually approved using interim criteria. These devices and simulators may continue to be used in FAR Part 135 training and checking activities in accordance with specific approvals currently in effect.

512. - 522. RESERVED

**TABLE 3.2.6.10
FLIGHT TRAINING
PIC/SIC FLIGHT TRAINING (ALL TRAINING CATEGORIES): HELICOPTER**

FLIGHT PHASE	TRAINING EVENT	CURRENTLY BEING DEVELOPED								ACFT
		LEVEL OF FLT TRNG DEVICE				LEVEL OF FLT SIM				
		4	5	6	7	A	B	C	D	
PREPARATION	Visual Inspection									
	Pretaxi Procedures									
	Performance Limitations									
SURFACE OPERATIONS	Starting									
	Rotor Engagement									
	Rotor Engagement on Water SEA									
	Taxiing									
	Water Taxiing SEA									
	Lift-to-Hover IGE/OGE M									
	Hover Turns IGE/OGE									
	Sideward/Rearward Hovering									
	Slope Operations									
	Liftoff									
	Landing									
	Taxiing									
TAKEOFF	Normal M									
	Instrument									
	Obstacle Clearance									
	Running (High Altitude)									
	Category “A” M									
	Category “A” M With Powerplant Failure Before CDP									
	Category “A” M With Powerplant Failure After CDP									
	Rejected Takeoff M									
CLIMB	Normal									
	Best Rate									
	Best Angle									
EN ROUTE	Medium-Banked Turns									
	Powerplant Shutdown and Restart									
	Low Speed Characteristics									
	High Speed Handling Characteristics									
DESCENT	Normal									
	Maximum Rate									
	Autorotative Glide									
APPROACHES	VFR Procedures M									
	Normal									
	Obstacle Clearance									
	High Altitude									
	Elevated Landing Site									
	With Degraded Control Augmentation									
	Balked Landing M									
	IFR Precision Approaches M									
	ILS/Normal									
	ILS/One-Engine Inoperative									
	[] MLS/Normal									
	[] MLS/One-Engine Inoperative									
	[] PAR/Normal									
	[] PAR/One-Engine Inoperative #									
	IFR Nonprecision Approaches M									
NDB/Normal										

TABLE 3.2.6.10
FLIGHT TRAINING
PIC/SIC FLIGHT TRAINING (ALL TRAINING CATEGORIES): HELICOPTER

FLIGHT PHASE	TRAINING EVENT	CURRENTLY BEING DEVELOPED								ACFT
		LEVEL OF FLT TRNG DEVICE				LEVEL OF FLT SIM				
		4	5	6	7	A	B	C	D	
APPROACHES (Cont'd)	VOR/Normal									
	[] LOC Backcourse Procedures									
	[] SDF/LDA Procedures									
	[] TACAN Procedures									
	[] ASR Procedures									
	[] RNAV Procedures									
	[] LORAN C Procedures [] Circling Approach (Simulator must be qualified for training and checking on the circling maneuver)									
	MISSED APPROACHES M From Precision Approach									
	From Nonprecision Approach									
	NOTE: At least one MAP must be a complete approved procedure									
With Powerplant Failure										
LANDINGS	Normal									
	Normal-to-the-water SEA									
	[] Category "A"									
	[] Category "A" With Powerplant Failure after LDP									
	Crosswind									
	From a Precision Approach									
	From a Precision Approach With at Least 50% Power Deficiency									
	With Degraded Control Arguments									
AFTER LANDING	Taxi									
	Parking #									
	Stopping the Rotors									
	Emergency Evacuation #									
UNPREPARED SITE OPERATIONS	Confined Areas									
	Pinnacles									
	Ridgelines									
	Water Sites SEA									
OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Holding									
	Ice Accumulation on Airframe #									
	Air Hazard Avoidance #									
	Windshear/Microburst									
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE	Pneumatic/Pressurization									
	Air Conditioning									
	Fuel and Oil									
	Electric									
	Hydraulic									
	Flight Controls									
	Auto-icing and Deicing Systems									
	Autopilot									
	Flight Management and Guidance Systems									
	Automatic or Other Approach & Landing Aids									
	Loss of Anti-Torque Effectiveness M									
	Airborne Radar Systems									
	Flight Instrument System Malfunction									
	Communications Equipment									
	Navigation Systems									
	- Normal									
	- Abnormal									
- Alternate										

TABLE 3.2.6.10. - Continued
FLIGHT TRAINING
PIC/SIC FLIGHT TRAINING (ALL TRAINING CATEGORIES): HELICOPTER

FLIGHT PHASE	TRAINING EVENT	CURRENTLY BEING DEVELOPED								ACFT
		LEVEL OF FLT TRNG DEVICE				LEVEL OF FLT SIM				
		4	5	6	7	A	B	C	D	
SYSTEMS	Aircraft Fires									
PROCEDURES	Smoke Control									
TRAINING	Powerplant Malfunctions									
DURING ANY	Electrical, Hydraulic, Pneumatic Systems									
AIRBORNE	Flight Control Systems Malfunction									
PHASE	Landing Gear Malfunction									
	Anti-Torque Failure M									
-Emergency	Settling-with-Power									

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